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(22)Date of filing : 20.05.1998 (72)Inventor : ELLA JUHA

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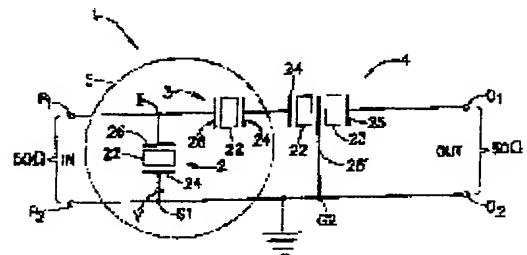
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## (54) STRUCTURE OF CRYSTAL FILTER AND FILTER UTILIZING THIN FILM BULK SURFACE ACOUSTIC WAVE RESONATOR

(57)Abstract:

**PROBLEM TO BE SOLVED:** To provide a filter with an improved frequency response characteristic that employs a bulk acoustic wave BAW ladder filter and a stacked crystal filter SCF device.

**SOLUTION:** A BAWR-SCF circuit 1 is a 4-port device that has BAW resonators 2, 3, and a stacked crystal filter 4, and also ports (that is, connecting points) P1, P2, and O1, O2. The input impedance to the ports P1, P2, and the output impedance at the ports O1, O2 are respectively 50 ohms. Electrodes 26, 24 of the BAW resonator 2 connect respectively to a connecting point I of the device 1 and to a connecting point G1 (earth). The upper electrode 26 of the BAW resonator 3 connects to the connecting point I and the lower electrode 24 of the BAW resonator 3 connects to the lower electrode 24 of the SCF 4. An intermediate electrode 26' of the SCF 4 connects to a connecting point G (earth). Moreover, an upper electrode 25 of the SCF 4 connects to the ground connecting point O1. The lower electrode 24 of the BAW resonator 2 connects to the ground connecting point G1, then a via V is provided to the device 1 as its structure.



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